WHAT IS CLAIMED IS:

1. A population of cells comprising at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulation of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte.

2. The population of cells of claim 1, wherein the population of cells is eukaryotic cells.

3. The population of cells of claim 1, wherein the population of cells is prokaryotic cells.

4. The population of cells of claim 1, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

5. The population of cells of claim 1, wherein said reporter gene is selected from a group consisting of a fluorescent protein, an enzyme and an affinity tag.

6. The population of cells of claim 4, wherein said cis-acting regulatory element is a promoter.

7. The population of cells of claim 6, wherein said promoter is selected from the group consisting of *MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB* and *yciD.*

8. The population of cells of claim 4, wherein said cis-acting regulatory element is stress regulated.

9. The population of cells of claim 1, wherein each of said first or said second analyte is independently selected from the group consisting of a condition and a substance.

10. The population of cells of claim 9, wherein said condition is selected from the group consisting of a temperature condition and a radiation condition.

11. The population of cells of claim 9, wherein said substance is a naturally occurring product or a synthetic product.

12. The population of cells of claim 1, wherein each of said at least two subpopulations of cells is tagged.

13. A device for detecting presence, absence or level of a substance in a sample, the device comprising a substrate being configured for supporting a population of cells including at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulations of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte, wherein each of said at least two subpopulations of cells is attached to said substrate in an addressable manner.

14. The device of claim 13, further comprising detector for detecting expression from each of said first and second reporter expression constructs in said population of cells.

15. The device of claim 13, wherein said population of cells is eukaryotic cells.

16. The device of claim 13, wherein said population of cells is prokaryotic cells.

17. The device of claim 13, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

18. The device of claim 13, wherein said reporter gene is selected from a group consisting of a fluorescent protein, an enzyme and an affinity tag.

19. The device of claim 17, wherein said cis-acting regulatory element is a promoter.

20. The device of claim 19, wherein said promoter is selected from the group consisting of *MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB* and *yciD.*

21. The device of claim 17, wherein said cis-acting regulatory element is stress regulated.

22. The device of claim 13, wherein each of said first or said second analyte is independently selected from the group consisting of a condition and a substance.

23. The device of claim 22, wherein said condition is selected from the group consisting of a temperature condition and a radiation condition.

24. The device of claim 22, wherein said substance is a naturally occurring product or a synthetic product.

25. The device of claim 13, wherein each of said at least two subpopulations of cells is tagged.

26. The device of claim 13, wherein said substrate is configured as a multiwell matrix, whereas each well includes a culture of one of said at least two subpopulations of cells.

27. The device of claim 13, wherein a material of said substrate is selected from the group consisting of a glass, a polymer, a ceramic, a metal and a composite thereof.

28. A system for detecting presence, absence or level of a substance in a sample, the system comprising:

(a) a device including a substrate being configured for supporting a population of cells including at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulations of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte, wherein each of said at least two subpopulations of cells is attached to said substrate in an addressable manner;

(b) a detector for detecting expression from each of said first and second reporter expression constructs in said population of cells; and

(c) a processing unit for obtaining and processing data representing said expression detected by said detector to thereby provide information relating to the presence, absence or level of the substance in the sample.

29. The system of claim 28, wherein said population of cells is eukaryotic cells.

30. The system of claim 28, wherein said population of cells is prokaryotic cells.

31. The system of claim 28, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

32. The system of claim 28, wherein said reporter gene is selected from a group consisting of a fluorescent protein, an enzyme and an affinity tag.

33. The system of claim 31, wherein said cis-acting regulatory element is a promoter.

34. The system of claim 33, wherein said promoter is selected from the group consisting of *MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB* and *yciD.*

35. The system of claim 31, wherein said cis-acting regulatory element is stress regulated.

36. The system of claim 28, wherein each of said first or said second analyte is independently selected from the group consisting of a condition and a substance.

37. The system of claim 36, wherein said condition is selected from the group consisting of a temperature condition and a radiation condition.

38. The system of claim 36, wherein said substance is a naturally occurring product or a synthetic product.

39. The system of claim 28, wherein each of said at least two subpopulations of cells is tagged.

40. The system of claim 28, wherein said substrate is configured as a multiwell matrix, whereas each well includes a culture of one of said at least two subpopulations of cells.

41. The system of claim 28, wherein a material of said substrate is selected from the group consisting of a glass, a polymer, a ceramic, a metal and a composite thereof.

42. A method of detecting presence, absence or level of a substance in a sample, the method comprising:

(a) exposing a population of cells to the sample, said population of cellsincluding at least two subpopulations of cells, wherein a first subpopulation of said at least two subpopulations of cells includes a first reporter expression construct being expressible in a cell of said first subpopulation when exposed to a first analyte and whereas a second subpopulation of said at least two subpopulation of cells includes a second reporter expression construct being expressible in a cell of said second subpopulation when exposed to a second analyte with the sample; and

(b) analyzing expression of said reporter expression constructs in each of said at least two subpopulations of cells, to thereby detect presence, absence or level of the substance in the sample.

43. The method of claim 42, wherein said population of cells is eukaryotic cells.

44. The method of claim 42, wherein said population of cells is prokaryotic cells.

45. The method of claim 42, wherein each of said reporter expression construct includes a cis-acting regulatory element being operably fused to a reporter gene.

46. The method of claim 42, wherein said reporter gene is selected from a group consisting of a fluorescent protein, an enzyme and an affinity tag.

47. The method of claim 45, wherein said cis-acting regulatory element is a promoter.

48. The method of claim 47, wherein said promoter is selected from the group consisting of *MipA, LacZ, GrpE, Fiu, MalPQ, oraA, nhoA, recA, otsAB* and *yciD.*

49. The method of claim 45, wherein said cis-acting regulatory element is stress regulated.

50. The method of claim 42, wherein each of said first or said second analyte is independently selected from the group consisting of a condition and a substance.

51. The method of claim 50, wherein said condition is selected from the group consisting of a temperature condition and a radiation condition.

52. The method of claim 50, wherein said substance is a naturally occurring product or a synthetic product.

53. The method of claim 42, wherein each of said at least two subpopulations of cells is tagged.

54. The method of claim 42, wherein analyzing expression is effected by a pattern recognition software.

55. The method of claim 54, wherein said pattern recognition software is combined with neural network.